



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/576,038

05/23/2000

Mark Sean Hefty

P8193

4371

76973

7590

10/16/2009

The Law Offices of Christopher K. Gagne  
c/o CPA Global  
B.O. Box 52050  
Minneapolis, MN 55402

EXAMINER

NGUYEN, THANH T

ART UNIT

PAPER NUMBER

2444

MAIL DATE

DELIVERY MODE

10/16/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/576,038	HEFTY ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	THANH TAMMY NGUYEN	2444	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to April 23, 2009.
2. ☒ The allowed claim(s) is/are 32-35, 38-42, 44-52, 54-56 (New claims 1-19).
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

**Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |  |  |
|--|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)   | 5. <input type="checkbox"/> Notice of Informal Patent Application                      |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),<br>Paper No./Mail Date _____    | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                    |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance   |
|  | 9. <input type="checkbox"/> Other _____.   |

/THANH TAMMY NGUYEN/  
Primary Examiner, Art Unit 2444



**UNITED STATES PATENT AND TRADEMARK OFFICE**

COMMISSIONER FOR PATENTS  
UNITED STATES PATENT AND TRADEMARK OFFICE  
WASHINGTON, D.C. 20231  
[www.uspto.gov](http://www.uspto.gov)

**EXAMINER'S AMENDMENT**

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

2. Authorization for this examiner's amendment was given in a telephone interview with Christopher K. Gane on June 1st, 2009.

3. The applicant has been amended as follow:

32. (Currently amended) A method comprising:

if an amount of data located in a first memory buffer in a local computer system associated with a remote direct memory access (RDMA) request does not exceed a maximum transfer size for a single memory to memory transfer operation over a data network to a remote memory buffer in a remote computer system :

associating the data with a first transfer operation over the data network to the remote memory buffer in the remote system; ~~and~~

if the amount of data associated with the first transfer operation has not reached the maximum transfer size, associating a portion of the data otherwise to be associated with a subsequent transfer operation for the RDMA request with the first transfer operation instead of with the subsequent transfer operation, the portion of the data being

Art Unit: 2444

located in one or more portions of one or more other memory buffers in the local computer system, the subsequent transfer operation being over the data network to the remote memory buffer in the remote computer system; and

if the amount of data located in the first memory buffer exceeds the maximum transfer size:

associating a portion of the data with the first transfer operation; and

associating one or more subsequent portions of the data with one or more subsequent transfer operations.

33. (Previously presented) The method of claim 32, additionally comprising transferring the data associated with the first transfer operation.

34. (Previously presented) The method of claim 33, additionally comprising associating a descriptor with the first transfer operation, the descriptor to specify the remote memory buffer to which the data is to be transferred and to indicate a portion of data remaining to be transferred for the RDMA request.

35. (Previously presented) The method of claim 32, additionally comprising associating data with one or more subsequent transfer operations.

36-37. (Cancelled).

38. (Previously presented) The method of claim 33, additionally comprising:  
associating a descriptor with the first transfer operation, the descriptor to specify the remote memory buffer to which the data is to be transferred and to indicate a portion of data remaining

Art Unit: 2444

to be transferred for the RDMA request; and transferring the data associated with the first transfer operation.

39. (Previously presented) The method of claim 38, additionally comprising: associating another descriptor with each of the one or more subsequent transfer operations; and transferring the data associated with the one or more subsequent transfer operations.

40. (Currently amended) An apparatus comprising: an RDMA (remote direct memory access) manager operable to service one or more RDMA requests, and to determine if an amount of data located in a first memory buffer in a local computer system associated with an RDMA request exceeds a maximum transfer size for a single memory to memory transfer operation over a data network to a remote memory buffer in a remote computer system, and:

if it is determined that the amount of data located in a first memory buffer does not exceed the maximum transfer size, then associate the data with a first transfer operation over the data network to the remote memory buffer in the remote computer system; and

if the amount of data associated with the first transfer operation has not reached the maximum transfer size associate a portion of the data otherwise to be associated with a subsequent transfer operation data for the RDMA request with the first transfer operation instead of with the subsequent transfer operation, the portion of the data being located in one or more portions of one or more other memory buffers in the local computer system, the subsequent transfer operation being over the network to the remote computer memory buffer in the remote computer system; and

Art Unit: 2444

the RDMA manager additionally operable to: determine if the amount of data located in the first memory buffer exceeds the maximum transfer size, and: if the amount of data located in the first memory buffer exceeds the maximum transfer size associate a portion of the data and a descriptor with the first transfer operation, the descriptor to specify the remote memory buffer to which the data is to be transferred and to indicate a portion of data remaining to be transferred for the RDMA request; and  
associate one or more subsequent portions of the data with one or more subsequent transfer operations.

41. (Previously presented) The apparatus of claim 40, the RDMA manager additionally operable to transfer the data associated with the first transfer operation.

42. (Previously presented) The apparatus of claim 40, the RDMA manager additionally operable to associate data with one or more subsequent transfer operations.

43. Cancelled.

44. (Currently amended) A system comprising:

a host fabric adapter device; and

an RDMA (remote direct memory access) manager included in a software

stack of the host fabric adapter, the RDMA manager operable to service one or more RDMA requests, and to:

determine if an amount of data located in a first memory buffer in a local system associated with an RDMA request exceeds a maximum transfer size for a single memory to memory transfer operation over a data network to a remote memory buffer in a remote system, and:

Art Unit: 2444

if it is determined that the amount of data located in a first memory buffer does not exceed the maximum transfer size, then associate the data with a first transfer operation over the data network to the remote memory buffer in the remote system; and

if the amount of data associated with the first transfer operation has not reached the maximum transfer size associate a portion of the data otherwise to be associated with a subsequent transfer operation for the RDMA request with the first transfer operation instead of with the subsequent transfer operation, the portion of the data being located in one or more portions of one or more other memory buffers in the local system, the subsequent transfer operation being over the data network to the remote memory buffer in the remote system; and the RDMA manager additionally operable to: determine if the amount of data located in the first memory buffer exceeds the maximum transfer size, and:

if the amount of data located in the first memory buffer exceeds the maximum transfer size:  
associate a portion of the data and a descriptor with the first transfer operation, the descriptor to specify the remote memory buffer to which the data is to be transferred and to indicate a portion of data remaining to be transferred for the RDMA request; and  
associate one or more subsequent portions of the data located with one or more subsequent transfer operations.

45. (Previously presented) The system of claim 44, the RDMA manager additionally operable to transfer the data associated with the first transfer operation.

46. (Cancelled).

47. (Cancelled).

48. (Currently amended) Computer-readable storage medium including program instructions to be executed by a computer processor for performing the following ~~[[Computer-readable memory having instructions~~ ~~An article comprising a machine-readable medium having machine-accessible instructions,~~ the instructions when executed by a machine result in operations comprising ~~the following~~]]:

if an amount of data located in a first memory buffer in a local computer system associated with a remote direct memory access (RDMA) request does not exceed a maximum transfer size for a single memory to memory transfer operation over a data network to a remote memory buffer in a remote computer system:

associating the data with a first transfer operation over the data network to the remote memory buffer in the remote system; ~~and~~

if the amount of data associated with the first transfer operation has not reached the maximum transfer size, associating a portion of the data otherwise to be associated with a subsequent transfer operation for the RDMA request with the first transfer operation instead of with the subsequent transfer operation, the portion of the data being located in one or more portions of one or more other memory buffers in the local system, the subsequent transfer operation being over the data network to the remote memory buffer in the remote system; and

if the amount of data located in the first memory buffer exceeds the maximum transfer size:

associating a portion of the data with the first transfer operation; and  
associating one or more subsequent portions of data located in the first memory buffer with a corresponding number of one or more subsequent transfer operations.



Art Unit: 2444

49. (Previously presented) The article of claim 48, additionally comprising instructions that result in a machine transferring the data associated with the first transfer operation.

50. (Previously presented) The article of claim 49, additionally comprising instructions that result in a machine associating a descriptor with the first transfer operation.

51. (Previously presented) The article of claim 48, additionally comprising instructions that result in a machine associating data with one or more subsequent transfer operations.

52. (Previously presented) The article of claim 51, wherein the first and one or more subsequent transfer operations are performed in response to one or more RDMA (remote direct memory access) requests.

53. (Cancelled).

54. (Previously presented) The article of claim ~~[[53]]~~ 48, additionally comprising instructions that result in a machine:

associating a descriptor with the first transfer operation, the descriptor to specify the remote memory buffer to which the data is to be transferred and to indicate a portion of data remaining to be transferred for the RDMA request; and  
transferring the data associated with the first transfer operation.

Art Unit: 2444

55. (Previously presented) The article of claim 54, additionally comprising instructions that result in a machine:

associating a descriptor with each of the one or more subsequent transfer operations; and transferring the data associated with the one or more subsequent transfer operations.

56.(Previously presented) The method of claim 32, wherein the RDMA request is received via a single function call and the portion of data corresponding to an amount of data that when added with the amount of data in the first memory buffer does not exceed the maximum transfer size.

4. Following is an examiner's statement of reasons for allowance:

5. With respect to claims 32-35, 38-42,44-46, 48-52, and 54-56, the prior art of record, individually or in combination, fails to teach, suggest or render obvious the claimed invention in combination with specific amended limitations as recited in claims 32, 40, 44, and 48.

6. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance.

### ***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tammy T. Nguyen whose telephone number is 571-272- 3929.

The examiner can normally be reached on Monday - Friday 8:30 - 5:30.

Art Unit: 2444

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ***William Vaughn*** can be reached on 571-272-3922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/THANH TAMMY NGUYEN/

Primary Examiner, Art Unit 2444